

IN THE CLAIMS:

Please amend claims 1-46 and add claims 47-48 as follows.

1. (Currently Amended) A method~~Method of load balancing in a wireless communication network, said wireless communication network comprising~~
~~at least one subscriber terminal (T1, T2, T2) adapted to establish and perform a wireless communication connection in said wireless communication network,~~
~~a plurality of access points (AP1, AP2, AP3) adapted to control said wireless communication connection of said at least one subscriber terminal and to exchange information with said at least one subscriber terminal, wherein one of said plurality of access points is associated with said at least one subscriber terminal, and~~
~~a load control device (21; 110) located outside of said subscriber terminal, said load control device being adapted to process information related to a load in said wireless communication network and to instruct roaming of said subscriber terminal from said associated one of said plurality of access points to another one of said plurality of access points,~~
~~said method comprising: the steps of~~
receiving roaming support information by means of signaling from a subscriber terminal via an interface to a load control device being located externally to the subscriber terminal, said roaming support information being determined on the basis of,
~~in said subscriber terminal, access point status information (APST) determined in said a~~

plurality of access points ~~and, (S10; S110) determining~~ communication status information related to ~~thesaid~~ plurality of access points; ~~(S20; S120), and processing (S20; S120) said received access point status information and said communication status information in order to obtain roaming support information (RSUP),~~

~~processing (S40; S160),~~ in said load control device, said roaming support information by an access point related load based roaming analysis;

~~and deciding (S50; S170),~~ on the basis of a result of said access point related load based roaming analysis, whether said subscriber terminal is to be associated with another one of said plurality of access points; and if so,

sending a command to a serving access point associated with said subscriber terminal, said command instructing the serving access point to initialize~~initializing (S60; S180) roaming of said subscriber terminal to said another one of said plurality of access points in said wireless communication network.~~

2. (Currently Amended) ~~Method according~~The method according to claim 1, wherein said access point status information (APST) ~~comprises~~ an access point identification element and an access point load status indicator determined in a respective access point.

3. (Currently Amended) ~~Method according~~The method according to claim 1, comprising determining the ~~wherein, in said step of determining~~ communication status

information, on the basis of a received signal strength indicator (RSSI) indicating the received signal strength of said plurality of access points is determined.

4. (Currently Amended) ~~Method according~~The method according to claim 1, comprising wherein, in said step of determining the communication status information on the basis of, a carrier to interference ratio (C/I) per each access point ~~is determined.~~

5. (Currently Amended) ~~Method according~~The method according to claim 1, comprising wherein, in said step of determining the communication status information, on the basis of a terminal transmit power status ~~is determined.~~

6. (Currently Amended) ~~Method according~~The method according to claim 1, wherein said roaming support information (RSUP), obtained ~~in said~~ by step of processing said received access point status information and said communication status information, comprises statistics of access point related communication status and load information derived from said ~~received~~ access point status information.

7. (Currently Amended) ~~Method according~~The method according to claim 1, wherein in said ~~step of~~ processing, in said load control device, said roaming support information by said access point related load based roaming analysis, comprises using of a hand-off algorithm ~~is used~~ to calculate load and connection quality situations for said

plurality of access points on the basis of said roaming support information and to determine an optimal access point for being associated with said subscriber terminal.

8. (Currently Amended) ~~Method according~~The method according to claim 1, comprising using of wherein processing parameters ~~used~~ in said access point related load based roaming analysis and derived from said roaming support information, wherein the processing parameters (RSUP) are differently weighted in said access point related load based roaming analysis.

9. (Currently Amended) ~~Method according~~The method according to claim 1, wherein said load control device (21) is located in at least one of said plurality of access points.

10. (Currently Amended) ~~Method according~~The method according to claim 1, wherein said load control device (110) is located in a network element (100) separated from said plurality of access points, said network element being connected with said plurality of access points ~~in said wireless communication network~~.

11. (Currently Amended) ~~Method according~~The method according to claim 10, further comprising: ~~the steps of~~

receiving, in said load control device in said network element, transmitting (S140)
access point internal monitoring information (~~APIM~~) from said plurality of access points;
~~to said load control device (110) in said network element,~~

determining (~~S150~~), in said load control device, access points available for said
subscriber terminal and selecting access point internal monitoring information of said
available access points;

processing (~~S160~~), in said load control device, said roaming support information
(~~RSUP~~) and said selected access point internal monitoring information (~~APIM~~) by an
enhanced access point related load based roaming analysis; and

deciding (~~S170~~), on the basis of a result of said enhanced access point related load
based roaming analysis, whether said subscriber terminal is to be associated with another
one of said plurality of access points; and if so,

sending a command to a serving access point associated with said subscriber
terminal, said command instructing the serving access point to initialize ~~initializing~~
(~~S180~~) ~~roaming of said subscriber terminal to said another one of said plurality of access~~
~~points in said wireless communication network.~~

12. (Currently Amended) ~~Method according~~ The method according to claim 11,
wherein said access point internal monitoring information (~~APIM~~) comprises at least one
of a retransmit rate to associated subscriber terminals, back-off windows, and a net
allocation vector for a respective one of said plurality of access points.

13. (Currently Amended) ~~Method according~~ The method according to claim 11, comprising using wherein processing parameters ~~used~~ in said enhanced access point related load based roaming analysis which are ~~and~~ derived from said roaming support information and said selected access point internal monitoring information, wherein the processing parameters are differently weighted in said enhanced access point related load based roaming analysis.

14. (Currently Amended) A system ~~System~~ for load balancing in a wireless communication network, said wireless communication network comprising

at least one subscriber terminal (~~T1, T2, T2~~) ~~adapted~~ configured to establish and perform a wireless communication connection in said wireless communication network, and

a plurality of access points (~~AP1, AP2, AP3~~) ~~adapted~~ configured to control said wireless communication connection of said at least one subscriber terminal and to exchange information with said at least one subscriber terminal, wherein one of said plurality of access points is associated with said at least one subscriber terminal,

said system comprising:

an access point load status monitoring means ~~unit~~ (~~11, 12, 13; 111, 112, 113~~) located in each one of said plurality of access points and ~~adapted~~ configured to measure a traffic load of an access point and to transmit access point status information; (~~APST~~),

a roaming support unit means (30; 300) located in said subscriber terminal and ~~adapted~~configured to receive said access point status information from said plurality of access points, to determine communication status information related to said plurality of access points, to process said received access point status information and said communication status information in order to obtain roaming support information (~~RSUP~~), and to transmit said roaming support information; and

a load control device (21; 110) ~~located outside of~~externally to said subscriber terminal, said load control device being ~~adapted~~configured to receive said roaming support information by signaling via an interface from said subscriber terminal, to process said roaming support information by an access point related load based roaming analysis, to decide, on the basis of a result of said access point related load based roaming analysis, whether said subscriber terminal is to be associated with another one of said plurality of access points, and to send a command to a serving access point associated with said subscriber terminal to initialize roaming of said subscriber terminal from said associated one to said another one of said plurality of access points in said wireless communication network.

15. (Currently Amended) ~~System according~~The system according to claim 14, wherein said access point status information (~~APST~~) comprises an access point identification element and an access point load status indicator determined in a respective access point.

16. (Currently Amended) ~~System according~~The system according to claim 14, wherein said roaming support ~~means~~unit is ~~adapted~~configured to determine a received signal strength indicator indicating the received signal strength of said plurality of access points.

17. (Currently Amended) ~~System according~~The system according to claim 14, wherein said roaming support ~~means~~unit is ~~adapted~~configured to determine a carrier to interference ratio per each access point.

18. (Currently Amended) ~~System according~~The system according to claim 14, wherein said roaming support ~~means~~unit is ~~adapted~~configured to determine a terminal transmit power status.

19. (Currently Amended) ~~System according~~The system according to claim 14, wherein said roaming support information obtained in and transmitted from said roaming support ~~means~~unit comprises statistics of access point related communication status and load information derived from said received access point status information.

20. (Currently Amended) ~~System according~~The system according to claim 14, wherein said load control device is ~~adapted~~configured to process said roaming support

information in said access point related load based roaming analysis by using a hand-off algorithm to calculate load and connection quality situations for said plurality of access points on the basis of said roaming support information and to determine an optimal access point for being associated with said subscriber terminal.

21. (Currently Amended) ~~System according~~The system according to claim 14, wherein said load control device is ~~adapted~~configured to differently weight processing parameters used in said access point related load based roaming analysis and derived from said roaming support information.

22. (Currently Amended) ~~System according~~The system according to claim 14, wherein said load control device-(21) is located in at least one of said plurality of access points.

23. (Currently Amended) ~~System according~~The system according to claim 14, wherein said load control device (110) is located in a network element (100) separated from said plurality of access points, said network element being connected with said plurality of access points in said wireless communication network.

24. (Currently Amended) ~~System according~~The system according to claim 21, said system further comprising:

an access point internal monitoring ~~means~~unit (211, 212, 213) located in each one of said plurality of access points and ~~adapted~~configured to determine access point internal monitoring information (~~APIM~~) and to transmit said access point internal monitoring information to said load control device,

wherein said load control device (~~110~~) is ~~adapted~~configured to determine, from said access point internal monitoring information, access points available for said subscriber terminal and to select access point internal monitoring information of said available access points, to process said roaming support information and said selected access point internal monitoring information by an enhanced access point related load based roaming analysis, to decide, on the basis of a result of said enhanced access point related load based roaming analysis, whether said subscriber terminal is to be associated with another one of said plurality of access points, and to initialize roaming of said subscriber terminal from said associated one to said another one of said plurality of access points in said wireless communication network.

25. (Currently Amended) ~~System according to~~The system according to claim 24, wherein said access point internal monitoring information comprises at least one of a retransmit rate to associated subscriber terminals, back-off windows, and a net allocation vector for a respective one of said plurality of access points.

26. (Currently Amended) ~~System according to~~The system according to claim 24, wherein said load control device is ~~adapted~~configured to differently weight processing parameters used in said enhanced access point related load based roaming analysis and derived from said roaming support information and said selected access point internal monitoring information.

27. (Currently Amended) A load ~~Load control device configured to: (21; 110) for~~
~~load balancing in a wireless communication network, said wireless communication~~
~~network comprising~~

~~at least one subscriber terminal (T1, T2, T2) adapted to establish and perform a~~
~~wireless communication connection in said wireless communication network, and~~

~~a plurality of access points (AP1, AP2, AP3) adapted to control said wireless~~
~~communication connection of said at least one subscriber terminal and to exchange~~
~~information with said at least one subscriber terminal, wherein one of said plurality of~~
~~access points is associated with said at least one subscriber terminal,~~

~~wherein said load control device is located outside of said subscriber terminal and~~
~~adapted to~~receive roaming support information by means of signaling from a subscriber
terminal via an interface, said roaming supporting information being determined on the
basis of process roaming support information (RSUP), received from a subscriber
~~terminal and derived by said subscriber terminal from access point status information~~
~~(APST) of said~~a plurality of access points;

process the roaming support information, by an access point related load based roaming analysis;

~~to~~ decide, on the basis of a result of said access point related load based roaming analysis, whether said subscriber terminal is to be associated with another one of said plurality of access points; and

~~to~~ send a command to a serving access point associated with said subscriber terminal, said command instructing the serving access point to initialize roaming of said subscriber terminal from said associated one to said another one of said plurality of access points in said wireless communication network,

wherein the load control device is located externally to said subscriber terminal.

28. (Currently Amended) ~~Load control device according~~The load control device according to claim 27, wherein said access point status information comprises an access point identification element and an access point load status indicator determined in a respective access point.

29. (Currently Amended) ~~Load control device according~~The load control device according to claim 27, wherein said roaming support information comprises at least a received signal strength indicator indicating the received signal strength of said plurality of access points.

30. (Currently Amended) ~~Load control device according~~The load control device according to claim 27, wherein said roaming support information comprises at least a carrier to interference ratio per each access point.

31. (Currently Amended) ~~Load control device according~~The load control device according to claim 27, wherein said roaming support information comprises at least a terminal transmit power status.

32. (Currently Amended) ~~Load control device according~~The load control device according to claim 27, wherein said roaming support information comprises statistics of access point related communication status and load information derived from said access point status information.

33. (Currently Amended) ~~Load control device according~~The load control device according to claim 27, wherein said load control device is ~~adapted~~configured to process said roaming support information in said access point related load based roaming analysis by using a hand-off algorithm to calculate load and connection quality situations for said plurality of access points on the basis of said roaming support information and to determine an optimal access point for being associated with said subscriber terminal.

34. (Currently Amended) ~~Load control device according~~The load control device according to claim 27, wherein said load control device is ~~adapted~~configured to differently weight processing parameters used in said access point related load based roaming analysis and derived from said roaming support information.

35. (Currently Amended) ~~Load control device according~~The load control device according to claim 27, wherein said load control device (21) is located in at least one of said plurality of access points.

36. (Currently Amended) ~~Load control device according~~The load control device according to claim 27, wherein said load control device (110) is located in a network element (100) separated from said plurality of access points, said network element being connected with said plurality of access points in said wireless communication network.

37. (Currently Amended) ~~Load control device according~~The load control device according to claim 36,

wherein said load control device (110) is ~~adapted~~configured to receive access point internal monitoring information (APIM) of said plurality of access points, to determine, from said access point internal monitoring information, access points available for said subscriber terminal and to select access point internal monitoring information of said available access points, to process said roaming support information and said

selected access point internal monitoring information by an enhanced access point related load based roaming analysis, to decide, on the basis of a result of said enhanced access point related load based roaming analysis, whether said subscriber terminal is to be associated with another one of said plurality of access points, and to send a command to a serving access point associated with said subscriber terminal, said command instructing the serving access point to initialize roaming of said subscriber terminal from said associated one to said another one of said plurality of access points in said wireless communication network.

38. (Currently Amended) ~~Load control device according~~The load control device according to claim 37, wherein said access point internal monitoring information comprises at least one of a retransmit rate to associated subscriber terminals, back-off windows, and a net allocation vector for a respective one of said plurality of access points.

39. (Currently Amended) ~~Load control device according~~The load control device according to claim 37, wherein said load control device is ~~adapted~~configured to differently weight processing parameters used in said enhanced access point related load based roaming analysis and derived from said roaming support information and said selected access point internal monitoring information.

40. (Currently Amended) An access ~~Access point (AP1, AP2, AP3)~~ usable in a wireless communication network, ~~said wireless communication network comprising at least one subscriber terminal (T1, T2, T2) adapted to establish and perform a wireless communication connection in said wireless communication network and further access points, said access point being adapted~~configured to control said ~~a~~ wireless communication connection of said ~~at least one subscriber terminal and to exchange information with said at least one subscriber terminal,~~

wherein said access point comprises:

access point load status monitoring means ~~(11, 12, 13)~~ adapted configured to measure a traffic load of an access point and to transmit access point status information, and

a load control device ~~(21)~~ according to claim 27.

41. (Currently Amended) A network ~~Network element usable (100)~~ in a wireless communication network, ~~said wireless communication network comprising~~

~~at least one subscriber terminal (T1, T2, T2) adapted to establish and perform a wireless communication connection in said wireless communication network, and~~

~~a plurality of access points (AP1, AP2, AP3) adapted to control said wireless communication connection of said at least one subscriber terminal and to exchange information with said at least one subscriber terminal, wherein one of said plurality of access points is associated with said at least one subscriber terminal,~~

wherein said network element (100) is separated from and connected to said plurality of access points and comprises a load control device (110) according to claim 27.

42. (Currently Amended) A subscriber ~~Subscriber~~ terminal (T1, T2, T3)-usable in a wireless communication network, ~~said wireless communication network comprising~~
~~a plurality of access points (AP1, AP2, AP3) adapted to control a wireless~~
~~communication connection of said subscriber terminal and to exchange information with~~
~~said subscriber terminal, wherein one of said plurality of access points is associated with~~
~~said subscriber terminal,~~

said subscriber terminal comprising:

roaming support means (30; 300) ~~adapted~~configured to receive access point status information (APST) from ~~said~~ a plurality of access points, to determine communication status information related to said plurality of access points, to process said received access point status information and said communication status information in order to obtain roaming support information ~~(RSUP)~~, and to transmit said roaming support information to a load control device (21; 110) according to claim 27,

wherein said subscriber terminal performs, in response to an instruction from a
serving access point triggered by said load control device, roaming from said associated one to another one of said plurality of access points in said wireless communication

network, said another one of said plurality of access points is indicated in said instruction from said load control device.

43. (Currently Amended) A cComputer program product embodied on a computer readable medium, the computer program product being configured to execute a method comprising:

receiving roaming support information by means of signaling from a subscriber terminal via an interface to a load control device being located externally to the subscriber terminal, said roaming support information being determined on the basis of access point status information determined in a plurality of access points and communication status information related to the plurality of access points;

processing, in said load control device, said roaming support information by an access point related load based roaming analysis;

deciding , on the basis of a result of said access point related load based roaming analysis, whether said subscriber terminal is to be associated with another one of said plurality of access points; and if so,

sending a command to a serving access point associated with said subscriber terminal, said command instructing the serving access point to initialize roaming of said subscriber terminal to said another one of said plurality of access points.

~~usable for a data processing apparatus, comprising software code portions for performing the steps of claim 1 when said product is run on said data processing apparatus.~~

44. (Currently Amended) ~~A~~The computer program product according to claim 43, wherein said computer program product comprises a medium readable by said data processing apparatus, on which said software code portions are stored.

45. (Currently Amended) The~~A~~ computer program product according to claim 43, wherein said computer program product is directly loadable into an internal memory of said data processing apparatus.

46. (Currently Amended) A computer program product according to claim 43, ~~the being usable for a~~ data processing apparatus comprises a system for load balancing in a wireless communication network, said wireless communication network comprising

at least one subscriber terminal (~~T1, T2, T2~~) ~~adapted~~configured to establish and perform a wireless communication connection in said wireless communication network, and

a plurality of access points (~~AP1, AP2, AP3~~) ~~adapted~~configured to control said wireless communication connection of said at least one subscriber terminal and to

exchange information with said at least one subscriber terminal, wherein one of said plurality of access points is associated with said at least one subscriber terminal,

said system comprising:

access point load status monitoring means ~~(11, 12, 13; 111, 112, 113)~~ located in each one of said plurality of access points and ~~adapted~~ configured to measure a traffic load of an access point and to transmit access point status information (~~APST~~),

roaming support means ~~(30; 300)~~ located in said subscriber terminal and ~~adapted~~ configured to receive said access point status information from said plurality of access points, to determine communication status information related to said plurality of access points, to process said received access point status information and said communication status information in order to obtain roaming support information (~~RSUP~~), and to transmit said roaming support information, and

a load control device ~~(21; 110)~~ located ~~outside of~~ externally to said subscriber terminal, said load control device being ~~adapted~~ configured to receive said roaming support information by means for signaling via an interface from the subscriber terminal to process said roaming support information by an access point related load based roaming analysis, to decide, on the basis of a result of said access point related load based roaming analysis, whether said subscriber terminal is to be associated with another one of said plurality of access points, and to send with said subscriber terminal, said command instructing the serving access point to initialize roaming of said subscriber terminal from

said associated one to said another one of said plurality of access points in said wireless communication network.

47. (New) A device comprising:

a receiver configured to receive, from a subscriber terminal, roaming support information by means of signaling via an interface, said roaming support information being determined on the basis of access point status information of a plurality of access points;

a processor configured to process the roaming support information by an access point related load based roaming analysis and to decide, on the basis of a result of said access point related load based roaming analysis, whether said subscriber terminal is to be associated with another one of said plurality of access points; and,

a sending configured to send a command to a serving access point associated with said subscriber terminal, said command instructing the serving access point to initialize roaming of said subscriber terminal from said associated one to said another one of said plurality of access points in a wireless communications network,

wherein the load control device is located externally to said subscriber terminal.

48. (New) A device comprising:

receiving means for receiving, from a subscriber terminal, roaming support information by means of signaling via an interface, said roaming support information

being determined on the basis of access point status information of a plurality of access points;

processing means for processing the roaming support information by an access point related load based roaming analysis;

deciding means for deciding, on the basis of a result of said access point related load based roaming analysis, whether said subscriber terminal is to be associated with another one of said plurality of access points; and,

sending means for sending a command to a serving access point associated with said subscriber terminal, said command instructing the serving access point to initialize roaming of said subscriber terminal from said associated one to said another one of said plurality of access points in a wireless communications network,

wherein the load control device is located externally to said subscriber terminal.